

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number
WO 2004/113835 A1

(51) International Patent Classification⁷: G01C 5/02, 15/00

(21) International Application Number:
PCT/SE2004/001018

(22) International Filing Date: 23 June 2004 (23.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/481,009 23 June 2003 (23.06.2003) US
0301830-6 23 June 2003 (23.06.2003) SE

(71) Applicant (for all designated States except US): TRIM-
BLE AB [SE/SE]; Box 64, S-182 11 Danderyd (SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): HERTZMAN, Mikael
[SE/SE]; Skansvägen 58, S-191 83 Sollentuna (SE).

(74) Agent: ALBIHNS STOCKHOLM AB; P.O. Box 5581,
S-114 85 Stockholm (SE).

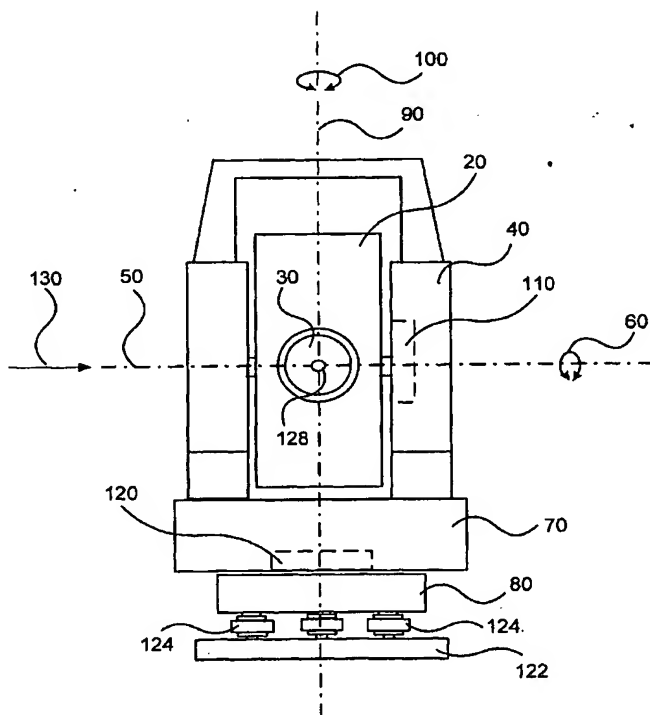
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

[Continued on next page]

(54) Title: A SURVEYING INSTRUMENT WITH COMPENSATION FOR MECHANICAL ERRORS



(57) Abstract: The invention relates to a method of operating a surveying instrument (10) placed in a orthogonal XYZ-system at (0,0,0) having a movable unit (20), said instrument defining a sight line (128) that is controllably rotatable around a first axis (50), essentially horizontal, and around a second axis (90), essentially vertical, wherein said second axis (90) may be inaccurately positioned so that it deviates from a true vertical axis, and said first axis (50) may deviate from being orthogonal to the second axis (90); the method comprising the steps of determining at least one of the following group of errors relating to the instrument and/or its location: a) a trunnion axis error T as a function of the deviation from 90 degrees between the first axis (50) and the second axis; b) a horizontal collimation error CH, being the deviation between the sight line (128) and the perpendicular angle as related to the first axis (50); and c) a total plumb error defined by components, PI and PII, being two separate angular values defining the tilt of the instrument as related to the plumb line through the same; and d) using these determined values in continuously controlling the alignment when aiming the instrument. The invention also relates to a surveying instrument for use with the method and an error compensation system for a surveying instrument.

WO 2004/113835 A1